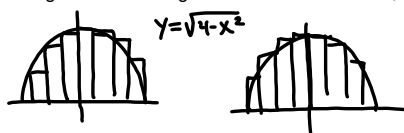


5.2 Definite Integrals

Estimate the area under the graph $f(x) = \sqrt{4-x^2}$ & above x-axis using various rectangular methods with $n = 10, 50, 100, 500$



lram = rram

What happens as n approaches infinity?

less error

$$\lim_{n \rightarrow \infty} \left. \begin{matrix} lram \\ rram \\ mram \end{matrix} \right\} = 2\pi$$

estimate
6.28

$$\text{exact: } \frac{1}{2}\pi r^2$$

$$\frac{1}{2}\pi \cdot 2^2 = 2\pi$$

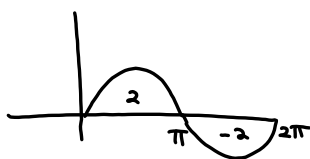
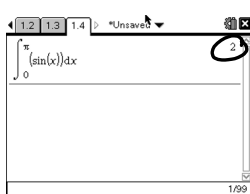
definition of a definite integral as a limit of a Riemann Sum

$$\begin{aligned} & [f(x_1) + f(x_2) + f(x_3) + \dots + f(x_n)] \Delta x \\ & \lim_{n \rightarrow \infty} \sum_{i=1}^n f(x_i) \Delta x = \int_a^b f(x) dx \\ & \lim_{n \rightarrow \infty} \text{Riemann Sum} = \text{area (exact)} \end{aligned}$$

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Nov 10-6:04 PM

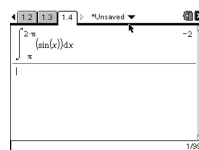
Definite Integrals on Nspire CAS



$$\int_0^{2\pi} \sin x dx = 0 \quad \text{net area}$$

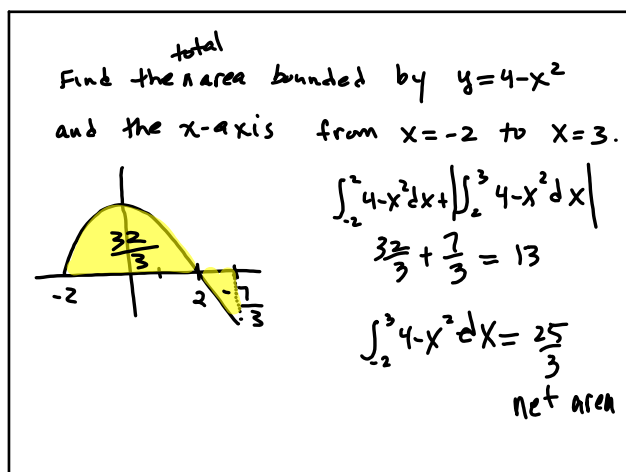
$$\int_{\pi}^{2\pi} \sin x dx = -2 \quad \text{net area}$$

Definite Integrals and signed area



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Nov 10-6:09 PM



Nov 2-10:10 AM